ENGINEERING EVALUATION

NOTRE DAME APARTMENTS

Application #8244 - Plant #15655

1590 Broadway Street
San Francisco, CA 94109

I. BACKGROUND

Notre Dame Apartments has applied for an Authority to Construct/Permit to Operate for the following equipment:

S-1 Emergency Diesel Generator, Olympian, Model D75P2, 117 HP, 75 kW, 1.4 MMBtu/hr.

The Emergency Diesel Engine Generator Set (S-1) is equipped with the best available control technology (BACT) for minimizing the release of air borne criteria pollutants and harmful air toxins due to fuel combustion. The criteria pollutants are nitrogen oxides (NOx), carbon monoxide (CO), precursor organic compounds (POC) from unburned diesel fuel, sulfur dioxide (SO2) and particulate matter (PM10). All of these pollutants are briefly discussed on the District's web site at baaqmd.gov.

The engine has a control module, turbocharger, charge air cooler and direct diesel fuel injection. The engine, S-1, meets the Environmental Protection Agency and California Air Resources Board (EPA/CARB) Tier 1 Mobile Off-Highway standard. The engine will burn commercially available California low sulfur diesel fuel. The sulfur content of the diesel fuel will not exceed 0.05% by weight. The operation of this engine, S-1, should not pose any health threat to the surrounding community or the public at large.

II. EMISSION CALCULATIONS

The S-1 Diesel Engine has been certified by CARB to be a cleaner burning engine. Except for SO2, the emission factors for this engine are from the CARB Certification (CARB Executive Order # U-R-022-0011). The SO2 emissions were calculated based on the maximum allowable sulfur content (0.05 wt% S) of the diesel fuel with assumption that all of the sulfur present will be converted to SO2 during the combustion process. The emissions calculation is as follows:

Emissions from S-1:
Hours of Operation = 100 hr/yr
Diesel Heat Capacity = 19,300 BTU/lb
Fuel Consumption = 9.88 gal/hr
Estimated Fuel Usage = 9.88 gal/hr X 100 hr/yr = 988 gal/yr.

NOx = 4.55 g/bhp-hr (117 hp)(1 lb/454 g)(100 hr/yr) = 122 lb/yr or 0.061 TPY
CO = 0.40 g/bhp-hr (117 hp)(1 lb/454 g)(100 hr/yr) = 10.7 lb/yr or 0.005 TPY
POC = 0.10 g/bhp-hr (117 hp)(1 lb/454 g)(100 hr/yr) = 2.7 lb/yr or 0.001 TPY
PM10 = 0.10 g/bhp-hr (117 hp)(1 lb/454 g)(100 hr/yr) = 2.7 lb/yr or 0.001 TPY
SOx = (9.88 gal/hr)(7.1 lb/gal)(0.0005S)(64 lb SO2/32 lb S)(100 hr/yr) = 7 lb/yr or 0.004 TPY

III. PLANT CUMULATIVE INCREASE AFTER 4/5/91

	Current	New	New Total	
	Ton/yr	Ton/yr	Lbs/yr	Tons/yr
POC =	0.00	0.001	2.7	0.001
NO_X =	0.00	0.061	122	0.061
SO_2 =	0.00	0.004	7	0.004
CO =	0.00	0.005	10.7	0.005
NPOC =	0.00	0.000	0	0.000

PM_{10} =	0.00	0.001	2.7	0.001

IV. TOXIC SCREENING ANALYSIS

This application required a Toxics Risk Screening because the diesel particulate emissions are greater than the toxic trigger level.

Toxic Pollutant Emitted	**Emission Rate for S-1 (lb/yr)**	**Risk Screening Trigger (lb/yr)**
PM 10 (Diesel Particulate)	2.7	0.6

S-1 does meet Best Available Control Technology for toxics (TBACT) since the diesel particulate emissions are less than 0.15 gr/bhp-hr. For an engine that meets the TBACT requirement, it must also pass the toxic risk screening level of less than ten in a million. The cancer risk is conservative. It assumes a constant exposure of the ultra sensitive population (young people, the elderly, and the infirm, etc...) at 24 hours for a 70 years life.

This emergency generator passed the Health Risk Screening Analysis (HRA) conducted on November 5, 2003 by the District's Toxic Evaluation Section. The source poses no significant toxic risk, since the risks to the maximally exposed residential receptor is 0.5 in a million. The hazard indexes for the residential receptor is less than 0.0003, based on 100 hours operation per year. The level of risk for students at St. Brigid School is 0.04 in a million and the hazard index is 0.0001. The level of risk for students at Sherman Elementary School is 0.03 in a million and the hazard index is 0.0001. The level of risk for students at Spring Valley Elementary School is 0.02 in a million and the hazard index is 0.0001. Thus, in accordance with the risk management policy, the screen passes, since the engine meets the TBACT requirement of 0.15 g/BHP-hr limitation for particulate emission.

V. BEST AVAILABLE CONTROL TECHNOLOGY

S-1 from this facility triggers BACT since the emission rate of NOx from this source is more than 10 pounds of emission per highest day per Regulation 2-2-301. The use of post emission filtration devices or a Selective Catalytic Reduction (SCR) System to meet BACT(1) is not required because it is not cost effective for a unit that will be used only during emergency and reliability-related activities. Source S-1 will comply with BACT(2) because it is CARB certified at the level below the BACT(2) requirements. BACT(2) requirements can be found on the District's web site under BACT/TBACT Handbook, Section 2 – Combustion Sources for I.C. Engine – Compression Ignition $\geq$ 175 HP, Document # 96.1.2.

	S-1 CARB certified	BACT(2)
NOx	4.55 g/bhp-hr	6.9 g/bhp-hr
CO	0.40 g/bhp-hr	2.75 g/bhp-hr
POC	0.10 g/bhp-hr	1.5 g/bhp-hr
PM10-diesel	0.10 g/bhp-hr	0.15 g/bhp-hr

VI. OFFSETS

Offsets are not required since the facility's POC, and NOx emissions are less than 15 ton/yr per Regulation 2-2-302.

VII. STATEMENT OF COMPLIANCE

Source S-1 is subject to and expected to be in compliance with the requirements of District Regulation 1-301 “Public Nuisance”, District Regulation 6 “Particulate Matter and Visible Emissions”, Regulation 9-8 “NOx and CO from Stationary Internal Combustion Engines" and Regulation 9-1 “Sulfur Dioxide”. In order to ensure compliance with the requirements of these regulations, the facility will be conditionally permitted to meet the requirements.

This project is considered to be ministerial under the District's CEQA Regulation 2-1-311 and therefore is not subject to CEQA review. The engineering review for this project requires only the application of standard permit conditions and standard emission factors in accordance with Permit Handbook Chapter 2.3.

The project is within 1000 feet of the nearest school and therefore the owner/operator is subject to the public notification requirements of Reg. 2-1-412. A public notice was prepared and sent on Date----. The public notices were sent to:

All addresses within ¼ mile of the diesel generator.
Parents and guardians of students at St. Brigid School, Sherman Elementary School, and Spring Valley Elementary School.

At the end of the comment period, that lasted for more than 30 days, there were ?? written comments. ??? phone-mail messages and ??? e-mail messages were received from parents of students at St. Brigid School, Sherman Elementary School, and Spring Valley Elementary School.

Offsets, PSD, NSPS, and NESHAPS are not triggered.

VIII. CONDITIONS

Permit condition for S-1, Emergency Generator, 117 HP, Notre Dame Apartments; Plant # 15655; Application # 8244.

1. The engine for emergency generator S-1 shall be fired exclusively on diesel fuel having a sulfur content no greater than 0.05% by weight. The sulfur content of the fuel oil shall be certified by the fuel oil vendor. [Basis: Cumulative Increase]

   “Emergency Conditions” is defined as any of the following: [Basis: Regulation 9-8-231]
   a. Loss of regular natural gas supply
   b. Failure of regular electric power supply
   c. Flood mitigation
   d. Sewage overflow mitigation
   e. Fire
   f. Failure of a primary motor, but only for such time as needed to repair or replace the primary motor.

2. S-1 shall only be operated to mitigate emergency conditions or for reliability-related activities. Operation for reliability-related activities shall not exceed 100 hours in any calendar year at this engine. Operation while mitigating emergency conditions is unlimited. [Basis: Regulation 9-8-330, Cumulative Increase]

   “Reliability-related activities” is defined as any of the following: [Basis: Regulation 9-8-232]
   a. Operation of an emergency standby engine to test its ability to perform for an emergency use, or
   b. Operation of an emergency standby engine during maintenance of a primary motor.

3. S-1 shall be equipped with either: [Basis: Regulation 9-8-530]
a non-resettable totalizing meter that measures the hours of operation for the engine
OR
a non-resettable fuel usage meter; the following factors shall be used to convert fuel usage to hours of operation:
S-1: 9.88 gal/hr.

4. The following monthly records shall be maintained in a District-approved log for at least 2 years for S-1 and shall be made available for District inspection upon request: [Basis: Regulations 9-8-530, 1-441]
   a. Total hours of operation for each engine
   b. Hours of operation under emergency conditions for each engine and a description of the nature of each emergency condition
   c. Fuel usage for S-1.

IX. RECOMMENDATION

Waive the Authority to Construct and Issue conditional Permit to Operate to Club Quarters for the following equipment:

S-1 Emergency Diesel Generator, Olympian, Model D75P2, 117 HP, 75 kW, 1.4 MMBtu/hr.

Craig Ullery
Air Quality Engineer II
Permit Services Division

Date: _____

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